



Space News Roundup

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No. 31

EURECA now ready to begin gathering data

After several false starts, the European Retrievable Carrier resumed the final leg of its journey toward an operational orbit and about nine months of life science and materials science experimentation Thursday.

All of the satellite's subsystems tested so far are working satisfactorily, according to reports from the European Space Agency's control center in Darmstadt, Germany. The only subsystems not yet exercised are the liquid cooling loop and the microgravity measurement subsystem, which will be initiated shortly before the routine experiment operations phase begins.

EURECA was scheduled to make its second orbital transfer maneuver early this morning, circularizing its orbit about 273 nautical miles above the Earth in a prime location for its microgravity experiments.

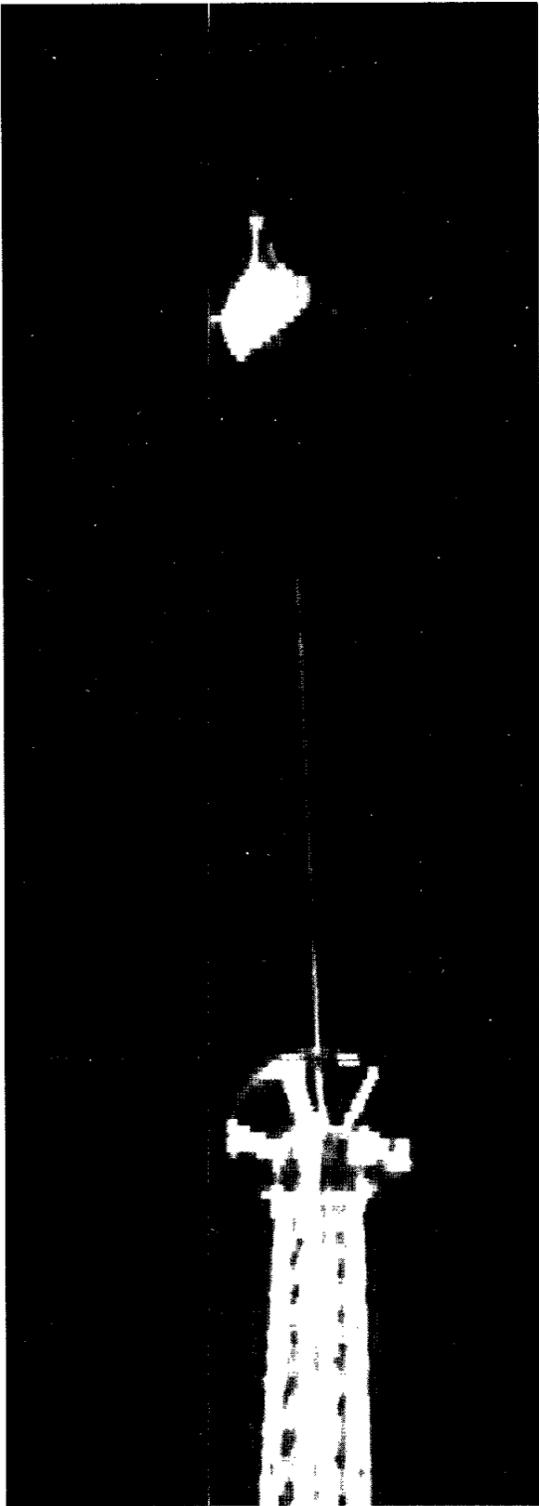
EURECA's deployment was delayed Saturday after the satellite was plucked from *Atlantis*' payload bay by Mission Specialist Claude Nicollier using the robot arm. ESA flight controllers reported data flow problems with the spacecraft, and the spacecraft's release was delayed by a day.

"Houston, we've got a release," said STS-46 Pilot Andy Allen after Nicollier let go the robot arms grasp at 2:07 a.m. CDT Sunday release.

After the release, ESA ground controllers commanded the satellite to begin its first of two separation burns but interrupted the planned 24-minute burn after about 6 minutes when they saw unexpected attitude data. The satellite was placed in a safe Sun-pointing mode while ESA evaluated telemetry.

The first transfer burn was resumed at 5:27 a.m. CST Thursday.

EURECA's first mission will be devoted to growing crystals, looking at the biological effects of space radiation, determining the critical points for fluids in microgravity, measuring the solar constant and its variability, measure trace gas densities in Earth's upper atmosphere and detect celestial gamma and x-ray sources.



The Tethered Satellite System payload bay, beginning a journey that would take it some 800 feet from the end of its extended boom.

NASA Electronic Photo

On, off-again mission sets stage for future success with tethers

By Kelly Humphries

In many ways, STS-46 was an on-again off-again mission, but in the final analysis the crew of *Atlantis* accomplished many of the flight's objectives and set the stage for future scientific success with tethered satellites.

"We learned a lot from this and we can build on it," said Tethered Satellite System-1 Mission Manager Billy Nunley. "We came very close to having a full mission."

The crew — Commander Loren Shriver, Pilot Andy Allen, Mission Specialists Jeff Hoffman, Marsha Ivins, Franklin Chang-Diaz and Claude Nicollier, and Payload Specialist Franco Malerba — launched nearly on schedule, just 48 seconds after the 8:56 a.m. Friday window opened. The European Retrievable Carrier satellite was lifted out of the payload bay on schedule, as well.

But the first objective of the mission — deploying EURECA — was off again when European Space Agency flight controllers saw unexpected data from the satellite. After a day of evaluation and a switch to the backup data path, the release was on again.

EURECA controllers began the satellite's orbital transfer maneuver, but had to stop the burn after several minutes. The orbital transfer maneuver was on again Thursday and the satellite was well on its way to its intended orbit.

TSS operations began on schedule, albeit a day late because of the EURECA deployment delay, with a nominal extension of its boom mechanism. But one of two umbilicals that connected the satellite to the orbiter wouldn't release at first.

TSS deployment was on again when Shriver pulsed *Atlantis*' maneuvering jets, adding a bit more force to that of the motor that was supposed to pull the engineering data plug, and the umbilical came free.

"To everybody's great pleasure, the system worked exactly as we were hoping it would out to about 179 meters," said STS-46 Lead Flight Director Chuck Shaw.

Then, another halt was called when the tether motors refused to play out any more line. The crew had no trouble controlling the satellite

on the end of its leash, he added. Shaw likened the hang-up to a jam in the feed mechanism on a weed whip.

After trouble shooting the problem, flight controllers and mission scientists had the crew reel in a bit of tether and then start reeling out again. The satellite got as far as 256 meters out before it stopped again under similar conditions.

After giving the STS-46 red team a night of rest and studying the situation further, another attempt was made to continue deployment Wednesday morning.

This time, the crew couldn't reel the tether in or out, and the jam scenario was different. Shaw formed a "tiger team" to look at alternatives to ensure retrieval of the satellite, including the possibility of using the shuttle's robot arm or a space walk by Mission Specialists Jeff Hoffman and Franklin Chang-Diaz.

The crew was able to begin retrieving the satellite after retracting the TSS boom at the same time the reel motor was pulling on the tether.

"We sucked in the tether from the bottom and that verified the jam was not at the bottom," Shaw said. "Then we put the brake on at the bottom and redeployed the boom."

The plan worked, and the tether began to reel in. After returning *Atlantis* to the retrieval attitude, the crew was able to bring TSS back into its cradle at the end of the boom. The retrieval, which was flown manually by the crew, went without incident.

Hoffman said several times that flying the tethered satellite in orbit was exactly like flying it in the simulator and that keeping control was a "hands off" proposition.

"We didn't quite get it (TSS-1) out as far as we would have liked to, but as my guidance procedures officer said at docking we've achieved two of the three objectives — the deploy and the dock of the satellite," Shaw said. "We flew the two scariest parts of the mission from the dynamics standpoint."

TSS-1 Mission Scientist Noble Stone said the science data that was collected was disappointing because at short tether lengths only low voltages and currents are possible. One of

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Astronaut 'Class of '92' arrives for JSC training

Twenty-four astronaut candidates arrived at JSC Monday, ready to begin a year of training.

In addition to the 15 mission specialist candidates and four pilot candidates selected by NASA in March, the group includes five international mission specialists.

The foreign candidates include two Canadians, one of them Marc Garneau, who flew in STS-41G — two European Space Agency candidates and one National Space Development Agency of Japan candidate.

"This special group of people we have with us today will be key members not only of shuttle missions, but also of our next human exploration event in space — Space Station *Freedom*," said Flight Crew Operations Director Don Puddy as he introduced the candidates to the news media in JSC's Bldg. 9N.

Astronaut Office Chief Dan Brandenstein said the new candidates will go through a year of rigorous training and then begin filling

technical assignments, where they are much needed since more than half of the astronaut corps is currently assigned to shuttle flights.

"The background of this group is quite varied," Brandenstein added, saying that the training period will expose the candidates to even more experts and experiences. "They all seem to be eager this morning to get with it, and we're ready to let them get on with it."

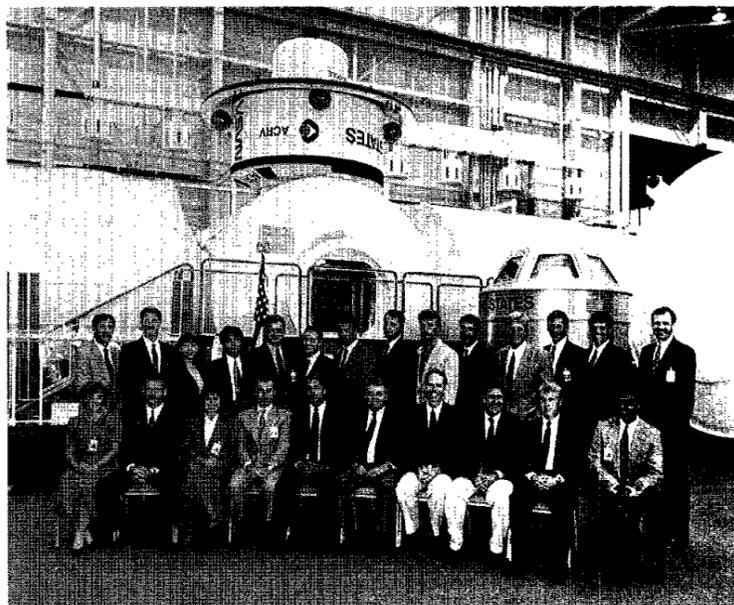
Garneau, 43, Ph.D., heads the Canadian Astronaut Office and flew on shuttle mission STS-41G in October 1984.

Royal Canadian Air Force Maj. Chris Hadfield, has been flying F/A-18s at the U.S. Navy Test Pilot School in Patuxent River, MD, for the last five years.

Maurizio Cheli (pronounced Kaele), 33, is an Italian who served as a military test pilot with the Italian Air Force.

Jean-Francois Clarvoy (pronounced Kler-vwah), 33, from

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The astronaut Class of '92 poses for its group portrait in front of the Space Station *Freedom* mockup in Bldg. 9N. Seated from left: Wendy Lawrence, Chris Hadfield, Mary Ellen Weber, Maurizio Cheli, Jerry Linenger, Chuck Brady, Dan Barry, John Grunsfeld, Andy Thomas and Winston Scott. Standing, from left: Scott Horowitz, Joe Tanner, Cady Coleman, Koichi Wakata, Marc Garneau, Jean-Francois Clarvoy, Mike Lopez-Alegria, Rick Linnehan, Brent Jett, Kent Rominger, Scott Parazynski, Mike Gernhardt, Kevin Kregel and Steve Smith.

JSC Photo by Jack Jacob

Man-Systems renamed Flight Crew Support

The name has changed to Flight Crew Support Division, but the focus remains the same for what used to be the Life Science Directorate's Man-Systems Division.

Life Sciences Director Carolyn Huttoon said all elements and personnel assignments within the division will remain unchanged. Chris Perner is the division chief.

"We are trying to realign the name with the broad spectrum of functions that the division does," said Deputy Division Chief Jim Taylor. "The name change is solely to better define what this division does. We're doing the same thing we were doing when we were chartered back in 1973."

Taylor said the division was created to focus on the human factors for space station conceptual support, and that the old name was consistent with the way space station names its distributed systems.

"We have since decided that what we do is much broader in scope than just the human factors development," he said.

JSC

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Gift Store from 10 a.m.-2 p.m. weekdays. For more information, call x35350 or x30990.

Metro passes, books, tickets available throughout August.
Fiesta Texas Park (San Antonio): adult, \$19.50; child 4-11, \$13.55.
Sea World (San Antonio): adult, \$18.90 (child free with paying adult); child 3-11 \$13.55.
Astroworld, \$16.95 and \$14.95 (child under 54 inches), \$44.95 (season pass) and Waterworld, \$9.50.
Six Flags, \$16.95 (one-day) and \$22.95 (two-day).
Movie discounts: General Cinema, \$4; AMC Theater, \$3.75; Loews Theater, \$4.
Stamps, Walt Disney Club memberships also available.
Upcoming events: Lovin' Feelings Concert (7:30 p.m. Sept. 26, Summit); tickets on sale Aug. 31.

JSC

Gilruth Center News

Sign up policy — All classes and athletic activities are first come, first served. Sign up in person at the Gilruth Center and show a badge or EAA membership card. Classes tend to fill up four weeks in advance. For more information, call x30304.

EAA badges — Dependents and spouses may apply for photo identification badges from 6:30-9 p.m. Monday through Friday. Dependents must be between 16 and 23 years old.

Weight Safety — Required course for employees wishing to use the Gilruth weight room is offered from 8-9:30 p.m. Aug. 11. Cost is \$5.

Defensive driving — Course is offered from 8 a.m.-5 p.m. Aug. 29. Cost is \$19.

Aerobics — High/low-impact classes meet from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is \$32 for eight weeks.

Exercise — Low-impact class meets from 5:15-6:15 p.m. Mondays and Wednesdays beginning Aug. 19. Cost is \$24.

Aikido — Martial arts class meets Tuesdays from 6:15-8 p.m. Cost is \$15 per month.

Ballroom dance — Ballroom dance lessons for beginners will be offered from 7-8:15 p.m. Thursdays beginning Aug. 13. Advanced classes will be from 8:15-9:30 p.m. Cost is \$60 per couple.

Softball tournament — The Summer Sizzler Men's Open "C" Softball Tournament will be Aug. 22-23 at the Gilruth. Entry fee is \$95; deadline is 7 p.m. Aug. 20.

Fitness program — Health Related Fitness Program includes medical examination screening, 12-week individually prescribed exercise program. Call Larry Wier, x30301.

JSC

Swap Shop

Swap Shop ads are accepted from current and retired NASA civil service employees and on-site contractor employees. Each ad must be submitted on a separate full-sized, revised JSC Form 1452. Deadline is 5 p.m. every Friday, two weeks before the desired date of publication. Ads may be run only once. Send ads to Roundup Swap Shop, Code AP3, or deliver them to the deposit box outside Rm. 147 in Bldg. 2. No phone or fax ads accepted.

Property

Sale: Webster, 3-2-2, new dishwasher, carpet, wallpaper, wet bar, FPL, ceiling fans, new kitchen floor, \$79.9K. x34771 or 480-9036.

Sale: Bay Glen, 4-2-5-2, 2 story w/formals, FPL, cov patio, sec sys, assumable, \$123K. 286-3019.

Sale: League City, Meadow Bend, 4-2-2, 1900 sq ft, 1/3 acre, storm windows/doors, custom deck/gazebo, \$93.5K. Kevin, 333-0940 or 538-4357.

Sale: Friendswood, 3-2-5-2, 1700 sq ft, new roof, new kitchen, new paint, new carpet, new AC, remodeled, \$66K. Randy, 282-4843 or 486-4940.

Sale: Camino South, 3-2-2, 1800 sq ft, formals, split floor plan, plush carpet, \$81.5K. 480-8252 or 488-8551.

Rent: 2 rooms in 4-3-2 house, \$300/mo. apb, lease thru Dec. Jeff, x33800 or Andy, 283-4502.

El Dorado Trace condo, lg 1 BR, 2 balconies, all appl, full sz W/D, alarm sys, ceiling fans, resvd parking, no pets, \$435/mo + dep. Mark, x30131 or 488-0056.

Sale: Pipers Meadow, 3-2-2, remodeled, custom int, marble in-lay FPL, new deck, fans, ceramic tile, \$70K. Randy, 282-4843 or 486-4940.

Sale: Dickinson, 3-2-2, cathedral ceiling, lg master BR, fenced, assumable, avail Aug. 1. 538-1217.

Lease: University Trace condo, 1 BR/study, W/D, D/W, ceiling fans, \$475/mo. + dep, avail 8-15-92. 488-2946 or 282-4616.

Lease: Pipers Meadow, 3-2-2A, fenced, new stove, AC, \$745/mo. 488-0315.

Rent: Sarasota, Fla, 1 BR condo, sleeps 4, avail week of 8-8 thru 8-15-92, \$650 OBO. 438-0201.

Sale: Lux French Country Estate, 4-3-5-3D, private, located on 5.25 acre, \$365K. x39250 or 996-8471.

Sale: Westwood Shores lot, util. George, x30162 or 578-9230.

Rent: Galve beach house, D/W, cent air, furn. Ed Shumilak, x37686.

Lease: Heritage Park, 3-2-2, FPL, fenced, ex cond, \$780/mo + dep. Walter, 280-1558 or 332-1609.

Sale: 71 acre ranch, deer blinds, deer feeders, 2 BR house, water well, elect, mineral rights, \$120K. 326-1833.

Lease: The Wharf, waterfront TH, 2-2-1+1, wraparound, porch. 332-6839.

Rent: Arkansas Lake cabin, furn, antiques, screened porch, accommodates 8, \$250/wk, \$50/day. x33005 or 338-2517.

Lease: Pebblebrook condo, 1-1, W/D, refig, FPL, new carpet, paint. Tom, 335-1514.

Lease: Clear Lake/Ellington, lg 2 BR condo, new paint, ceiling fans, W/D conn, vaulted ceilings, \$450/mo. + dep, avail Aug 1. 538-3680.

Rent: furn 1 BR efficiency, paid util, lease, references, \$425/mo. x32799 or 532-1725.

Lease/Sale: Nassau Bay TH, 4-2-2, remodeled, master dn, 2-story LR, 2000 sq ft, \$1290/mo or \$119.9K. Jerry, x38922 or 488-5307.

Rent: Galv condo, furn, sleeps 6, Seawall Blvd & 61st st, W/M/D. Magdi Yassa, 333-4760 or 486-0788.

Sale: Pearlland, 3-2-2, new appl, 1700 sq ft, 5 yr old roof/ac, open design, ceiling fans, microwave, \$66.5K. x34771 or 480-9036.

Cars & Trucks

'87 BMW 325, low miles, ex. cond. David, x38947.

'77 Grand Prix, new eng/transmission, ex. cond, \$1K OBO. David, 554-5514.

'84 Olds Cutlass Calais, 4 DR, V6, cruise, tilt, 85K mi., \$2495 OBO. 244-5068 or 333-6243.

'91 Dodge Dynasty, V6, wht/blue int, 35K mi, power brakes/locks, tinted windows, AM/FM, cass, ex cond, \$8995. 488-3550.

'75 Chev. Camaro, 350 eng, runs good, \$850 OBO. Terry, 282-4777 or 474-5639.

'84 - '90 BMW 3-series service indicator reseter, \$65; sheep skin seat covers, \$55; windshield sun shade, \$30; repair manual, \$25; oil filters, \$4/ea, all in ex. cond. x39150.

'91 Camaro RS, red, 5.0, auto, all power, alarm, \$12.5K. Tim, 324-3840.

'82 Vanagon L camper, rebuilt, remodeled, 10K new mi, \$7.8K; '85 VW Golf, 75K mi, stereo, AC, sunroof. Mike, 283-5890 or 868-5132.

'79 Mazda RX7, cold air, 4 spd, new paint, rust w/bk int, 77K mi, \$2K. 488-5218.

'88 S10 Blazer, 4.3L Tahoe, auto, air pwr doors and windows, roof rack, blue/silver, 55K mi, ex. cond. Mike, 339-3514.

'81 Chevy Citation, V6, silver/maroon, AC, auto, PS/PB, 119K mi, good cond, first \$750. x39250 or 996-8471.

'89 Mazda 323, 3 DR hatchback, AC, 4 spd, AM/FM/cass, 68K mi, ex cond, \$4K. 538-1299.

'90 Turbo Plymouth Laser, pwr boost accessories, turbo exhaust/boost control system, car cover. Bill Lear, x38165 or 486-4141.

'84 Dodge Ram 1/2 ton PU, good tires, good cond, \$2.5K. 282-3095.

'90 Eagle Talon TSI, all wheel drive, turbo, wht, AC, PS, AM/FM/cass, pwr window/locks, \$13.5K. 532-2059.

'76 Plymouth Duster, mech restored, maintenance records, some parts w/warranties, \$1.5K. x32799 or 532-1725.

'88 Toyota Corolla SR5, red, 40K mi., \$6.9K OBO. x36069 or 538-3322.

Boats & Planes

'34' Hunter sailboat, inbd diesel, roller-furl jib, VHF, AC, stereo, ex cond, \$34K. Dale, 334-3393.

2 '63' Bessell thruster surfboards, good cond, \$175; '60' Maxwell, fair cond, \$100. Billy, x31339 or 286-5219.

Cycles

'86 VFR750 Interceptor, 4K mi, ex cond, 2 yrs on ext warr, \$3K. Russell, x33862 or 286-7877.

Honda FT500 motorcycle eng, needs work, use for parts, \$15. Terry, 282-4777 or 474-5639.

Two Fuji-Ace road bikes, one 60 cm frame, one 52 cm frame, both blk, less than 25 hrs, \$350. 225-4064.

'90 Yamaha 100 RT, less than 50 hrs, red/black, \$900. x35961 or 332-2050.

Girls scooter, lt purple, ex cond, \$25 OBO. 486-5527.

'79 Suzuki GS550, 13K mi, runs well, \$450. Mike, x34378 or 486-4983.

'82 Yamaha Seca 750, shaft drive, 4 cyl, fairing, 16K mi, ex cond, \$1.2K OBO; '82 Kawasaki

JSC

Today

Cafeteria menu — Special: tuna and noodle casserole. Entrees: liver and onions, deviled crabs, roast beef with dressing. Soup: seafood gumbo. Vegetables: whipped potatoes, peas, cauliflower.

Monday

College registration — A member of the San Jacinto College staff will be at JSC from 1:30-3 p.m. Aug. 10 to register employees for on-site academic courses this fall. Classes available are General Psychology and English Composition II. Only 14 openings are available on a first-come, first-served basis; employees must submit applications for training and bring driver's license, license plate number and Social Security card. For more information, call Estella Gillette at x33077.

Cafeteria menu — Special: breaded outlet. Entrees: beef chop suey, Polish sausage with potato salad. Soup: French onion. Vegetables: okra and tomatoes, green peas.

Tuesday

Cafeteria menu — Special: fried chicken. Entrees: Salisbury steak, shrimp Creole. Soup: split pea. Vegetables: mixed vegetables, beets, whipped potatoes.

Wednesday

PSI meets — The Clear Lake/NASA Area Chapter of Professional Secretaries International will meet at 5:30 p.m. Aug. 12 at the Holiday Inn on NASA Road 1. Lisa Giacchino Tolman, an attorney, will discuss the legal effects of not having a will in the state of Texas and

financial considerations when preparing a will. Cost is \$10; reservations may be faxed to 676-8676. For more information, call Bonnie House at 676-3764.

Astronomy seminar — JSC Astronomy Seminar will be held from noon to 1 p.m. Aug. 12 in Bldg. 31, Room 129. For more information, contact Al Jackson at 333-7679.

Cafeteria menu — Special: stuffed bell pepper. Entrees: fried catfish with hush puppies, braised beef rib, barbecue plate, wieners and beans, shrimp salad. Soup: seafood gumbo. Vegetables: corn O'Brian, rice, Italian green beans.

Thursday

Graduate study meeting — A meeting to exchange information about graduate study at the University of Houston's Cullen School of Engineering will be held at 3 p.m. Aug. 13 in the Bldg. 30 auditorium. Dr. Charles Dalton, assistant dean of engineering, will discuss graduate engineering course work and degree programs including the new master's degree in aerospace engineering. For more information, call Paige Maultsby at x33078.

Cafeteria menu — Special: barbecue smoked link. Entrees: beef Stroganoff, turkey and dressing. Soup: chicken noodle. Vegetables: Lima beans, buttered squash, Spanish rice.

Aug. 14

Cafeteria menu — Special: meat sauce and spaghetti. Entrees: baked scrod, liver and onions, fried shrimp. Soup: seafood gumbo. Vegetables:

green beans, buttered broccoli, whipped potatoes.

Aug. 17

UNIX meeting — The JSC UNIX Systems Administration Group will meet at 2 p.m. Aug. 17 in Bldg. 12, Rm. 256. Emily Lonsford of MITRE will discuss "UNIX Security." For more information, call Mark Hutchison, x31141.

Aug. 18

Expert systems workshop — JSC's Software Technology Branch and IBM Corp. are sponsoring a series of workshops on verification and validation of knowledge-based systems at the Gilruth Center. The next workshops will be from 8 a.m.-4:30 p.m. Aug. 18, 20, 25 and 27. For more information, call Chris Culbert, 283-8080; Bebe Ly, 283-8072; David Hamilton, 282-3857; or Scott French, 282-8346.

Aug. 19

Astronomy Seminar — The JSC Astronomy Seminars will present a videotape of "Astrophysical Properties of Jupiter" with Dr. A.J. Dessler will be shown at noon Aug. 19 in Bldg. 31, Room 129. For more information, contact Al Jackson at 333-7679.

Toastmasters meet — The Spaceland Toastmasters Club will meet at 7:15 a.m. Aug. 19 in the Bldg. 3 cafeteria. For more information, call Darrell Boyd at x36803.

Aug. 26

Astronomy seminar — JSC Astronomy Seminar will be held from noon to 1 p.m. Aug. 26 in Bldg. 31, Room 129. For more information, contact Al Jackson at 333-7679.

KDX175 Enduro, not street legal, \$300. Hooper, x39027 or 585-0156.

Audiovisual & Computers

Smith Corona D-100 dot matrix printer, good cond, \$50. 334-1115.

Tandy 1000 EX computer, 8088, no HD, 640K ram, 5.25 int, 3.5 ext, CGA moni, mouse, joystick, software, \$200 for all or priced separately. Greg, x37318.

Sony SRS-37 spkrs, built-in amp, best offer. Ron, x30887.

IBM XT computer, 10 MB HD, 64K ram, mono, \$200. 283-5657 or 286-4911.

Pioneer RT707 reel-to-reel tape recorder, \$400 OBO; Heathkit HW202 2m xsciever+AC pwr supply, \$50 OBO; Heathkit HR10 RCVR, \$40 OBO; T199/4A comp, access, \$225 OBO; Pioneer cass, \$40; Pioneer turntable, \$30. 843-3685.

IBM XT, color monitor, 30 MB HD, 640K, 2.5/25 FD, 2400 baud modem, mouse, \$375. Cherylin, x33958 or 437-1265.

Marantz stereo amp/tuner sys, JVC loud spkrs, Sony cass, deck, \$250. Mike, x39039 or 528-1036.

IBM comp software, Quattro SE, \$45; Windows 3.0, \$40; Desktop Publisher, \$40; Eight-In-One, \$25; Sansui SR-333 direct drive turntable, \$50. Paul, x33573 or 559-2528.

Sega Genesis game sys, w/2 games, 1 yr old, ex cond, \$100. 486-5527.

Photographic

Beseler color darkrm equip, 23 cil w/colorhead, stabilized pwr supply, PM2 color analyzer, motorized base, 35mm & 6x7 lens, negative carriers, \$800. Randy, 326-1775.

Pets & Livestock

Free, 3 mo old gray/white kitten. 488-5709.

Shelti pups, 6 weeks old, shots, \$185. 771-1012.

AKC cocker pups, born 5-10-92, \$135. Tamela, x36155 or 998-8859.

Keeshound, AKC, male, 1 yr old, housetrained, \$50 negotiable. 484-4168.

AKC reg cocker spaniel pups, parti/buff, tails docked, dew claus removed, born 6-19-92, \$200. 996-9415.

AKC chihuahua pups, fawn/chocolate, 2 males, 1 female, \$200 cash. 534-3893.

Parakeets, home raised, blue & aqua marine, \$5/ea. x32767 or 532-1725.

Musical Instruments

'73 Fender Rhodes electric piano, \$140. Mike, 283-5890 or 868-5132.

Household

Solid wood dining table, china cabinet, \$350; sectional sofa, \$300; antique armoire w/marble, \$500; decorative curio cabinet, \$200; pastel plaid sofa, \$150. David, x38947.

Solid oak stereo cabinet, 6' tall, 4 shelves, matching tv stand w/roll-out VCR shelf, \$75; lt blue recliner chair, \$50. 286-0319.

Dark green sofa, good cond, \$150; Sears heavy-duty shampooer/polisher, \$40. Joanne, 283-5683 or 474-3517.

Kenmore frost free refig, \$100 OBO. Mike, 283-5890 or 868-5132.

Glass, brass, wood DR table, 4 chairs w/tan uphol, \$100; 2 twin beds w/matt, \$40. 337-6831.

LR furn, sofa, tables, coffee table, recliner, \$175 or \$40/ea.; 2 lamps, \$10/ea. Karen, 480-1658.

Whitewashed pine armoire, country French, \$750. Donna, x31206 or 538-1147.

Magic Chef slide in elec range, solid top element, self clean oven, almon, \$450 OBO. 481-1486.

Two sets twin sz box springs/matt, \$95/set. 283-0230 or 478-5817.

Sofa, chair, \$300; coffee, end-drum tables, marble inlay, \$100/ea; Curtis Mathis record changer/radio, stereo console, \$75. 488-3588.

Super Twin waterbed w/bookcase style hdbd, complete w/heater, 3 rail pads, \$275. Tom, x31710 or 538-1581.

China buffet, country French, lt finish, ex cond, \$350. 992-5745.

King sz matt, box springs, ex cond, \$200 OBO. Kristal, x30804 or 585-6789.

19" Sears color tv, portable, needs remote, \$75. 534-3893.

CA King sz matt w/box springs, ex cond, \$400. x32767 or 532-1725.

LR set, sofa, chair, ottoman, coffee table, end table, 2 lamps, brwn check w/wood trim, \$250 OBO; dog pen 6x3x6 w/wood floor & wood roof, \$50. Terry, x33814 or 486-9760.

Jenn-Air frost free refig, two vertical drs, ice maker, temp control dwr, wine rack, ice cube & water dispenser, was \$1.4K, sell \$950. Gunter, x38106 or 485-8398.

Wanted

Want drummer to form rock band, 60's - 90's. Russell, x33862 or 286-7877.

Want female roommate to share 3 BR house in Lake Side, nonsmoker, \$370/mo. incl. util + dep. Ann, 282-3790.

Want nonsmoking female roommate to share house in CL, \$250/mo. + 1/3 util. Theresa, 333-7772 or 480-6980.

Want students to join Russian language class, beginning/intermediate level, a few months exp. Rick, x36042 or Keith, x38024.

Want fiberglass camper shell or bedliner for '84 Nissan PU. 925-8664.

Want 50's style outfits for male/female for H.S. class reunion, poodle skirt, sweaters. 333-3425.

Want Lionel trains. Ed. 538-1147.

Want riders for carpool from Humble/Kingwood area. Latonya Bailey, x39032 or 360-1835.

Want bicycle helmet for 5 yr old child. Heather, x38129.

Want nonsmoking female roommate to share 2-2.5-2cp condo on Egret Bay, \$325/mo. + 1/2 util. x37263.

Want Hayes compatible ext modem, 1200 baud or better. 332-0365.

Want to trade flight instruction for karate lessons. x32814 or 992-2728.

Want person to serve as asst/co-coach in NASA pony league baseball, 13 - 14 yr olds, next spring, HS exp desired. Ros Kelso, x35483 or 480-2997.

Want gas edger. Enrique, 282-8551 or 554-4543.

Close Cooperation

Working together for 30 years, NASA, Texas Medical Center make remarkable strides for humanity

[Editor's note: NASA's exhibit at the Republican National Convention in Houston's Astrodome will focus on the 30-year cooperative effort by JSC and the Texas Medical Center. This is the first installment of a two-part article by the managing editor of Texas Medical Center News that details the history of that cooperation, which has been an important asset in NASA's efforts to put humans to work in space and in TMC's work to develop dramatic advancements in health care and medicine.]



By Rosanne Clark

Ever since human beings began venturing into space, the question of how they would survive the elements of this harsh new frontier, perform their designated tasks and return home safely has been a top priority.

Concern over the astronauts' safety and well-being has sparked a strong, long-lasting partnership between two scientific communities — space and medicine — and a close, cooperative relationship between Houston's two largest employers — the Texas Medical Center and JSC.

That partnership — "NASA and the Texas Medical Center: 30 Years of Cooperation — Past, Present and Future" — will be the subject of a major exhibit in the entranceway of the Astroarena during the Republican National Convention, Aug. 17-20.

The relationship began simply enough. As early as 1962, Dr. James P. Henry (then head of the biomedical research office of what was then known as NASA's Manned Spacecraft Center), began a series of conferences between NASA scientists and

physicians nationwide specializing in the field of electroencephalography (EEG) to discuss the application of this specialty in selecting astronauts and monitoring brain function during space flight. Included in the discussions were Dr. Peter Kellaway and Dr. Robert L. Maulsby of Baylor College of Medicine.

According to Dr. Lawrence F. Dietlein, who later chaired the conferences and now is JSC's assistant director for life sciences, the meetings resulted in NASA's use of direct monitoring of brain electrical activity to measure the impact of space flight on the astronauts' depth of sleep, alertness and performance.

The first in-flight test of EEG monitoring was made in December 1965 on Astronaut Frank Borman during the GT-7 flight of the Gemini Program.

At about the same time, physicians at The Institute for Rehabilitation and Research and Baylor College of Medicine began working with NASA scientists on a series of bed-rest tests to determine the impact of space flight on cardiovascular deconditioning, bone demineralization and orthostatic hypotension. The effect of isometric exercises during bed rest in preventing or mini-

mizing these conditions was also explored.

These early studies — plus the numerous ones that followed throughout the Gemini, Apollo, and Skylab, and Apollo-Soyuz programs — laid the groundwork for the close, cooperative relationship that the Texas Medical Center and NASA enjoy today as the space shuttle Spacelab program paves the technological way for Space Station Freedom.

As Dietlein points out, "Without the help and cooperation of the Texas Medical Center, we (life sciences) might not even be here today."

From its inception, NASA has been committed to extending the benefits of its scientific and technological achievements and research beyond the direct needs of space missions, and applying the results of agency programs to the improvement of life on Earth.

Of the more than 30,000 technology applications that have resulted from the space program to date, a large number are now being used in the practice of medicine throughout the world in such fields as cardiology, cancer and immunology research, emergency medicine, osteoporosis, radiology and toxicology.

As noted heart surgeon Dr. Michael E. DeBakey recently

pointed out at a Congressional field hearing conducted by the U.S. House of Representatives' Subcommittee on Space, "Some of these technologies have proved to be of extraordinary value in the diagnosis, therapy and further research of disease states which continue to plague human beings."

DeBakey and Dr. George Noon of Baylor College of Medicine currently are working with NASA scientists to develop a totally implantable artificial heart assist device.

According to DeBakey and Dietlein, several elements conspired to create these medically useful devices and techniques. Miniaturization — or the need to obtain maximum efficiency from all spacecraft elements because of early booster thrust deficiencies — was one. This alone dictated an economy of weight, volume and power in spacecraft systems and subsystems, they said.

Small bioelectric signal conditioners with long-lived electrodes were required beginning with the Mercury program. The reduction in size and the high reliability of the instruments were the precursors of implantable cardiac pacemakers to regulate the heart rate of patients whose hearts were beating too slowly.

The development of bidirectional telemetry used in weather satellites and planetary spacecraft resulted in programmable pacemakers in which the heart rate can be adjusted as necessary without further surgery. The useful battery life was initially five years, but later refinements have resulted in batteries that can be recharged without removal from the body. Still later refinements witnessed the advent of pacemakers combined with dysrhythmia (ventricular tachycardia or fibrillation) detection and abort devices. Thus, today's pacemakers not only regulate heart rate, but also detect and arrest serious (and often fatal) irregularities in heart rhythm by electrically shocking the heart.

Another offspring of space technology is the Programmable Implantable Medication System, which is capable of metering out medication (insulin, chemotherapy drugs, anti-clotting agents, etc.) in precise doses. The basis for this revolutionary medication delivery device came from the highly miniaturized fluid controls used for metering nutrients into soil samples collected by the unmanned Viking lander on Mars in 1975.

The use of biotelemetry, a method whereby physiological bioelectric data are converted into signals that are then sent to monitor personnel at remote locations, is now used routinely for monitoring patients in the intensive or coronary care units of hospitals, newborns who are being transported from one unit to the next, or emergency patients that are being transported in ambulances by paramedics.

For instance, the elaborate communications system that the Houston Fire Department/Houston Emergency Medical Services and Ben Taub General Hospital use to coordinate and monitor patient transport to the city's busy Level I trauma center was developed with the help of NASA scientists and technology, says Dr. Sam Pool, JSC's chief of medical sciences.

One of the most dramatic areas of technology transfer has been in the development of such diagnostic marvels as computer-assisted tomography (CAT scans), Magnetic Resonance Imaging (MRI) and Positron Emission Tomography (PET) that have been instrumental in the detection and early diagnosis of various diseases. These highly specialized scanning instruments were based on the satellite image-enhancement technology NASA used in Landsat, a satellite that produces digitized electronic pictures of the Earth's resources.

One of the single most moving applications of space technology to medical science occurred at Texas Children's Hospital in the 1970s when David "The Bubble Boy" was born. David, who lived until the age of 12, made headlines throughout the world because he had an extremely rare condition known as severe combined immune deficiency syndrome, which rendered his body incapable of warding off infections and dictated that he live in a perfectly sterile environment. Applying what they knew about controlling the astronauts' exposure to the deadly atmospheric conditions of outer space, NASA scientists worked closely with physicians at Baylor College of Medicine and Texas Children's Hospital to design a sterile, plastic environment for David to live in which filtered out potentially deadly viruses and bacteria.

Later, they developed a small, mobile space suit and life support assist device so the youngster could leave the confines of his germ-free "plastic bubble" and take trips outside his home and throughout the hospital, Pool said. □

Top: David, who became known as "The Bubble Boy," is able to be held by his mother for the first time in 1977 thanks to four years of planning and spinoff technology from the space program that resulted in his mobile isolation garment and its support system. David, who suffered from severe combined immune deficiency, lived 12 years as NASA scientists worked closely with physicians at Baylor College of Medicine and Texas Children's Hospital to provide a germ-proof environment for him. Right: NASA Bioinstrument Technician John Keefer, assisted by space suit technician Allen Rochford, attaches a biomedical cable to Astronaut Frank Borman's space suit. Medical sensors were attached to Borman's head during the first in-flight test of remote electroencephalograph monitoring was made during Gemini VII in December 1965.



NASA Photos

Hickmon takes reins in Logistics Division

James A. Hickmon has been appointed chief of Center Operations' Logistics Division.

Hickmon, who joined JSC in 1967 following service with the Navy, has held a variety of positions at JSC

JSC

People

including chief of the Supply Operations Section, chief of the Supply Branch and deputy chief of the Logistics Division. He has played an integral role in the development of the center's new Integrated Supply Management System.

Hickmon will remain JSC's supply and equipment management officer temporarily.

Joel B. Walker, chief of the Transportation Branch, has been appointed deputy director of the division.

Walker, who worked at Goddard

Space Flight Center and Kennedy Space Flight Center before joining JSC in 1986, will temporarily remain

JSC transportation officer. He has been chief of the Program Transportation Section and chief of the

Transportation Branch.

Delp heads research, engineering procurement

Sharon Delp has been selected as chief of Procurement's Research and Engineering Procurement Division.

Delp, who previously was chief of the Engineering Procurement Branch, replaces Dave Bruce, who retired July 10.

In two other Procurement appointments, George Hyde has been



Hickmon



Walker



Delp



Mancuso



Peters



Garner

named deputy chief of the Space Station Procurement Division, and George Moran was transferred to JSC's Contract Administration Office in Huntington Beach, Calif.

Hyde, formerly was chief of the Space Station Systems Procurement Branch, is the first to hold the newly created position.

Moran previously was a contracting officer in the Center Operations Procurement Branch.

Mancuso acting deputy in space station office

Dr. Thomas G. Mancuso has been appointed acting deputy manager for management in the Space Station Projects Office, with a special

assignment to Huntington Beach.

Mancuso will work directly with the Work Package 2 prime contractor, McDonnell Douglas Space Systems Co. Space Station Division in the transition from the design to development, production and test phases of the project. He will be responsible for developing management and contract management policies and strategies, and for integrating management and planning processes.

As part of the effort to increasing JSC presence at Huntington Beach, Frederick Peters has been chosen to head up the Space Station Projects Resident Office. His deputy will be John Vincze. Under Peters, the resident office will assume an expanded role including key areas

of project management.

Peters joined JSC in 1962 in the Apollo Spacecraft Program Office, and worked in the Skylab and space shuttle programs. He was director of Grumman Corp.'s Space Station Program Support Division in Reston, Va., from 1987 to 1992.

Correction

A photograph of Charlotte Garner was mislabeled in the Space News Roundup's July 24 "People" column.

Garner, of Webb, Murray & Associates Inc., has been named Safety Professional of the Year by the Gulf Coast Chapter of the American Society of Safety Engineers.

Scientists urged to SOAR out of their ivory towers

The head of the Air Force's Armstrong Laboratory told participants at the 1992 Space Operations, Applications and Research Symposium this week that both NASA and Air Force scientists need to get out of their ivory towers.

Dr. Billy Welch, director of the facility at Brooks Air Force Base, Texas, said both agencies need to expand their horizons by talking with other researchers involved in similar work, as well as with representatives of user organizations.

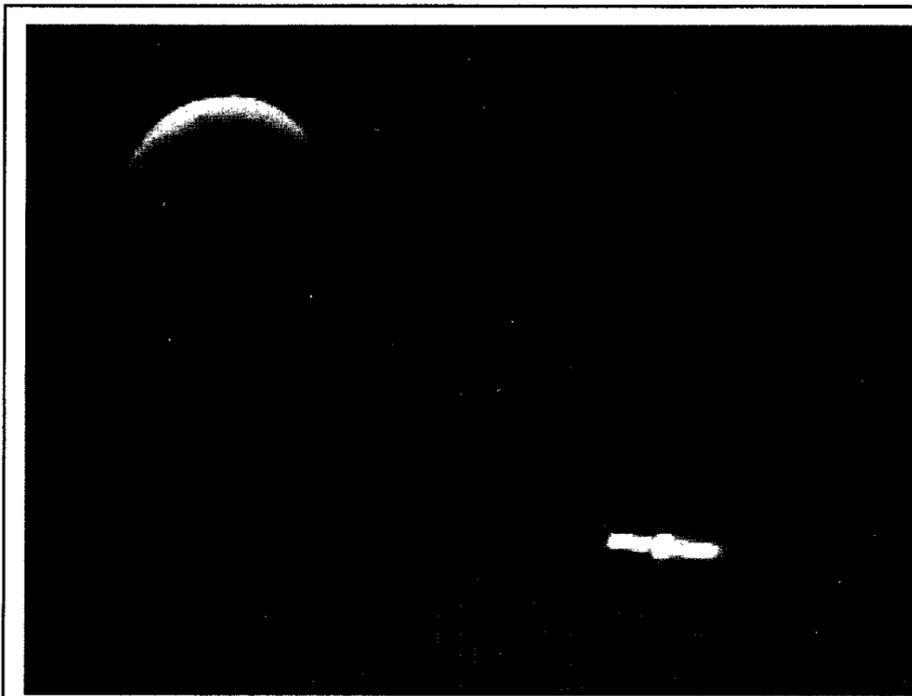
Welch the objectives of NASA and the Air Force in technology development are often similar, and that Congress and the administration are urging that the two research programs need to be closely coordinated.

About 400 people registered for SOAR '92, held Tuesday through Thursday at the Gilruth Center, said JSC Chief Technologist Kumar Krishen, one of the gathering's co-chairs. Many more visited the symposium's 36 exhibits.

Key technical areas discussed were robotics and telepresence, automation and intelligent systems, human factors, life support and space maintenance and servicing.

Dr. Robert Norwood, NASA's deputy director of space technology, pointed out the importance of operations research and technology needed for the Space Technology Interdependence Group to continue developing interdependence projects involving NASA, the Department of Defense and the Department of Energy.

Dr. Allan Schell, principal assistant to the deputy chief of staff for science and technology in the Air Force's recently established Materiel Command, said coordination between STIG and DOD's Joint Directors of Laboratories is an important step in a new coordinated science and technology management process.



NASA Electronic Photo

MOON OVER EURECA—The Retrieval Carrier moves away from the Space Shuttle Atlantis following its first orbital transfer maneuvering burn. That burn was cut short when EURECA flight controllers in Darmstadt, Germany, saw unexpected data, but was successfully completed Thursday morning. All systems aboard the spacecraft appear to be functioning well.

TSS valuable learning experience

(Continued from Page 1)

the chief science objectives of the mission was to investigate the ability of tethers to produce large amounts of electrical power as they sweep through the Earth's magnetic field. Neither were the scientists able to excite the types of instabilities in the space plasma phenomena that they had hoped to study.

"We did not achieve our primary objectives of the mission from the science point of view," Stone said. "We didn't approach those. The science team was very disappointed in the results of the mission."

On the other hand, Nunley and Stone said nearly all of the hardware and instruments designed for the mission worked perfectly.

"We did have problems with the upper tether control mechanism," Nunley said. "When we get the hardware back, we'll go in and find out what the problem is and we will fix that hardware."

Stone said the Italian-built satellite worked perfectly, and that all of its instruments

behaved well and returned good data.

"We learned things in areas that we were very concerned with. We're more convinced than ever that this is a very flyable system," Shaw said. "If we knew all the answers and we knew the system was going to operate perfectly, it wouldn't have been a test flight. We would have gone out there and generated power and run the orbiter on it."

After reberthing TSS, the crew moved on to its work with the Evaluation of Oxygen Interaction with Materials designed to obtain accurate measurements of how atomic oxygen in orbit interacts with space station materials.

The mission was extended a day after the initial difficulties in deploying EURECA, so the crew was expected to have plenty of time to complete the EOIM investigations.

Landing is scheduled for 6:39 a.m. CDT Saturday at Kennedy Space Center. If landing occurs on time, a welcome home ceremony is planned at Ellington Field about 3:30 p.m.

Three earn key shuttle, station jobs

JSC Acting Director Paul J. Weitz will announce three key personnel assignments Monday affecting the Space Station Projects Office and the Orbiter and GFE Projects Office.

Carl B. Shelley has been named deputy manager for program and operations integration in the Space Station Projects Office. Jack C. Boykin has been assigned deputy manager of the Space Station Projects Office, and Phillip C. Glynn has been named deputy manager of the Orbiter and GFE Projects Office.

All three assignments are pending NASA Headquarters approval.

Shelley, who joined JSC 27 years ago after serving with the Air Force, has held progressively responsible technical and managerial positions. These included deputy director for Mission Operations, manager of the Space Station Program Office's Customer Integration Office, manager of the Mission Operations Directorate's Operations Office and deputy manager of the Space Station Projects Office.

Boykin, who joined JSC in 1965 through the cooperative education program, was deputy manager of orbiter and GFE projects. He has served in increasingly important jobs including assistant manager for software integration; manager of the Avionics Systems Office and deputy manager of the National Space Transportation System Engineering Integration Office.

Glynn has held a variety of positions at JSC over the past 25 years, including subsystem manager for the Apollo Command Module and Lunar Excursion Module, chief of the Structures Branch in Engineering's Structures and Thermal Division, deputy chief of that division, and manager of the Orbiter Engineering Office.



Shelley



Boykin



Glynn

Astronaut candidates have wide variety of backgrounds

(Continued from Page 1)

France, heads the parabolic flight program for CNES the French space agency). He became an astronaut for CNES in 1985 and was selected as an ESA astronaut this year.

Koichi Wakata, 29, from NASDA, is a structural engineer in the airframe group with Japan Airlines.

NASA's mission specialist candidates include:

Daniel T. Barry, Ph.D., M.D., 38, is an assistant professor at the University of Michigan Medical Center.

Navy Cdr. Charles E. Brady Jr., 40, is a flight surgeon at the Naval Air Station in Whidbey Island, WA.

Air Force Capt. Catherine G. Coleman, Ph.D., 31, is a research chemist at Wright-Patterson AFB,

Ohio.

Michael L. Gernhardt, Ph.D., 36, is vice president and general manager of Oceanering Space Systems.

John M. Grunsfeld, Ph.D., 33, is a senior research fellow at the California Institute of Technology.

Navy Lt. Cdr. Wendy B. Lawrence, 33, has a masters degree in ocean engineering and is a physics instructor at the U.S. Naval Academy.

Navy Cdr. Jerry M. Linenger, Ph.D., 37, is a medical researcher at the Naval Health Research Center in San Diego.

Air Force Capt. Richard M. Linnehan, DVM, 34, is a clinical veterinarian at the U.S. Army Element of the Naval Ocean Systems Center

in San Diego.

Navy Lt. Cdr. Michael E. Lopez-Alegria, 34, is an ES-3A Program manager at the Naval Air Test School in Patuxent River.

Scott E. Parzynski, M.D., 31, is an emergency medicine resident in Denver.

Navy Cdr. Winston E. Scott, 41, is deputy director of the Tactical Air Systems Department at the Naval Air Development Center in Warminster.

Steven L. Smith, 34, is a payload flight controller at JSC.

Joseph R. Tanner, 42, is deputy chief of the Aircraft Operations Division at JSC.

Andrew S. W. Thomas, Ph.D., 40, is group supervisor of microgravity

research at NASA's Jet Propulsion Laboratory.

Mary E. Weber, Ph.D., 29, is a materials engineer at Texas Instruments on assignment to SEMATECH.

Pilot candidates include:

Air Force Capt. Scott J. Horowitz, 35, an experimental test pilot at Edwards AFB.

Navy Lt. Cdr. Brent W. Jett Jr., 33, is a fighter pilot and squadron department head at the Naval Air Station in Oceana, Va.

Kevin R. Kregel, 35, is an aeronautical research pilot at JSC.

Navy Lt. Cdr. Kent V. Rominger, 35, is an operations officer on the VF-211 at the Naval Air Station at Miramar.

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